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CLAIMS

1. A substrate transfer apparatus for a component mounting machine, for transferring a substrate into a mounting process (8) in which components are mounted onto the substrate and transferring the substrate from said mounting process (8), comprising:

a mounting-waiting process (7) for making the substrate to be transferred into the mounting process (8) wait before the mounting process (8); and

a substrate discharge-waiting process (9) for making the substrate after being transferred from the mounting process (8) wait before a following process, wherein detecting means is provided for detecting, when transfer of an unmounted substrate (3) from said mounting-waiting process (7) to the mounting process (8) and transfer of a mounted substrate (2) for which mounting has been done in the mounting process (8) from the mounting process (8) to the substrate discharge-waiting process (9) are simultaneously performed, that a plurality of substrates have been transferred into the substrate discharge-waiting process (9) continuously.

2. The substrate transfer apparatus for a component mounting machine according to claim 1, wherein the detecting means includes: a substrate-arrival detecting sensor (5c) for detecting the mounted substrate (2) transferred into the substrate discharge-waiting process (9); and a substrate-

continuity detecting sensor (6), provided in an upstream of the substrate-arrival detecting sensor (5c), for detecting the unmounted substrate (3) transferred continuously with the mounted substrate (2).

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3. The substrate transfer apparatus for a component mounting machine according to claim 2, wherein the substrate-continuity detecting sensor (6) is arranged at a position that satisfies $X < X_S < 2X$, where a distance from the substrate-arrival detecting sensor (5c) to the substrate-continuity detecting sensor (6) is X_S and a substrate dimension in a substrate transfer direction is X .

4. The substrate transfer apparatus for a component mounting machine according to claim 3, wherein the substrate-continuity detecting sensor (6) is arranged to be movable to the position that satisfies $X < X_S < 2X$.

5. The substrate transfer apparatus for a component mounting machine according to claim 3, wherein the substrate-continuity detecting sensor (6) is constructed to automatically movable to the position that satisfies $X < X_S < 2X$, in accordance with the substrate dimension X in the substrate transfer direction.

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6. The substrate transfer apparatus for a component mounting machine according to claim 1, wherein the detecting

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means includes: a substrate-arrival detecting sensor (5c) for detecting the mounted substrate (2) transferred into the substrate discharge-waiting process (9); and a plurality of substrate-continuity detecting sensors (6a, 6b, 6c), provided in an upstream of the substrate-arrival detecting sensor (5c) at different positions in a substrate transfer direction from each other, for detecting the unmounted substrate (3) that has been continuously transferred after the mounted substrate (2).

7. The substrate transfer apparatus for a component mounting machine according to claim 6, wherein the substrate-continuity detecting sensors (6a, 6b, 6c) detect the unmounted substrate (3) by a substrate-detection state of one (6b) of the plurality of substrate-continuity detecting sensors (6a, 6b, 6c) that is located at a position satisfying $X < X_S < 2X$, where a distance from the substrate-arrival detecting sensor (5c) to the one substrate-continuity detecting sensor (6b) is X_S and a substrate dimension in the substrate transfer direction is X .

8. The substrate transfer apparatus for a component mounting machine according to any one of claims 6 and 7, wherein the substrate transfer apparatus includes a minimum required number of the substrate-continuity detecting sensors (6a, 6b, 6c) by arranging N sensors that satisfy $2^n \times P_{\min} > P_{\max}$ at positions determined by $2^n \times P_{\min} / 2$ ($n = 1, 2, \dots, N$) from a minimum substrate size (P_{\min}) and a maximum substrate size (P_{\max}) in the substrate transfer direction,

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VO 2004/016062

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respectively, for which the electronic component mounting machine (1) is intended.